



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/599,420	11/06/2006	Geoffrey Harding	11NS201653	8581
52082	7590	03/17/2008		
GENERAL ELECTRIC CO.			EXAMINER	
GLOBAL PATENT OPERATION			ARTMAN, THOMAS R	
187 Danbury Road				
Suite 204			ART UNIT	PAPER NUMBER
Wilton, CT 06897-4122			2882	
		NOTIFICATION DATE		DELIVERY MODE
		03/17/2008		ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

gpo.mail@ge.com  
allyson.carnaroli@ge.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/599,420	<b>Applicant(s)</b> HARDING, GEOFFREY
	<b>Examiner</b> THOMAS R. ARTMAN	<b>Art Unit</b> 2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### **Status**

1) Responsive to communication(s) filed on 28 September 2006.

2a) This action is FINAL.      2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### **Disposition of Claims**

4) Claim(s) 1-15 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 1-15 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### **Application Papers**

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 28 September 2006 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### **Priority under 35 U.S.C. § 119**

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All    b) Some \* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### **Attachment(s)**

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO-166/08)  
 Paper No(s)/Mail Date 10/30/08.

4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.

5) Notice of Informal Patent Application

6) Other: \_\_\_\_\_.

**DETAILED ACTION**

***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Information Disclosure Statement***

The information disclosure statement (IDS) submitted on October 30<sup>th</sup>, 2006, is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner. Please see the attached PTO-1449 form.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are generally narrative and indefinite, failing to conform with current U.S. practice. For example:

Claim 1, lines 4-6, the limitation "...and the exit angle...exiting through the x-ray beam exit window..." doesn't make sense.

Claim 2, line 2, the term "exit" appears to be a typographical error and should be "entry."

In addition, line 2 includes a narrow range "in particular of tungsten" of the broader range "a metal foil." The claim shall be examined with respect to the broader range.

Claims 4 and 5, in line 2 of each, have the term "it." The pronoun lacks venue as it is unclear to what preceding limitation the term "it" refers.

Claim 5, lines 2-3, the limitation "...in the region of focus...and outside the region of focus..." doesn't make sense.

Claims 10-14 are unclear because the X, Y and Z axes are undefined, having no point or plane of reference from which the axes may be determined with respect to the claimed structure.

Furthermore, with respect to claim 13, the anode angle and the angle of incidence lack antecedence, and are thus undefined and therefore indefinite.

#### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 5 and 10-15 are rejected under 35 U.S.C. 102(e) as being anticipated by

Kutschera (US 6,735,283 B2).

Regarding claim 1, Kutschera discloses an anode module (Fig.3), including:

- a) an electron entry window 21 in a region of focus,
- b) an x-ray beam exit window 14 opposite to the electron window, where
- c) the exit angle of the x-ray beams along the direction of incidence of the electron beam is between 5 and 50 degrees (angle alpha, Fig.3).

With respect to claim 5, Kutschera further discloses a constriction 15 outside the region of focus.

With respect to claim 10, Kutschera further discloses that the focus runs parallel to a plane perpendicular to the direction of flow of the liquid metal (flow is perpendicular to the page in the cross-section of Fig.3).

With respect to claim 11, Kutschera further discloses that the angle of incidence of the electron beam with respect to an axis is 5 to 65 degrees (Fig.3).

With respect to claim 12, Kutschera further discloses that an angle between the exit direction of the x-ray beam and an axis is 10 to 50 degrees (Fig.3).

With respect to claim 13, Kutschera further discloses that the angle of incidence of the electron beam and an exit angle of the x-ray beam lie in a common plane (Fig.3).

With respect to claim 14, Kutschera further discloses that the width to height ratio of the x-ray beam is not unity (flat beam, col.4, l.7-10).

With respect to claim 15, Kutschera further disclose an x-radiator (Figs.1 and 3) having an electron source 4 for the emission of electrons and a liquid metal anode 12 emitting x-ray beams upon impingement of the electrons, and further having the anode module of claim 1.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2-4, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kutschera, as applied to claim 1 above.

With respect to claim 2, Kutschera does not specifically disclose the material for the electron entry window 21.

However, the gamut of materials claimed are well known to the skilled artisan for effective electron beam windows, each having their respective advantages depending upon the electron beam energy, composition of atmosphere on either side (or vacuum), etc.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Kutschera to have an electron exit window of metal foil, diamond film, ceramic, etc., as is known in the art as a matter of design choice, lacking a critical nature of the material.

With respect to claim 3, Kutschera does not specifically disclose the material for the x-ray exit window 14. However, Kutschera does teach that the vacuum envelope 2 may be glass, ceramic or metals, including steel.

Thin steel sheets are known to the skilled artisan for effective x-ray exit windows that are strong and reliable under the high stresses of maintaining the vacuum over the necessarily small thicknesses as well as the stresses caused by heating and helping to conduct heat away from the window.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Kutschera to have an x-ray exit window of a steel sheet of 100 to 400 microns in thickness as is known in the art for a reliable and effective x-ray window.

With respect to claims 4, 8 and 9, Kutschera does not specifically disclose the dimensions of the region of focus.

However, such dimensions are known to the skilled artisan and readily modified by tube voltage, current, cathode cup voltage, etc., as desired by the specific needs of the x-ray beam application.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Kutschera to achieve the region of focus dimensions as desired.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Mihara (US 6,807,248 B2) teaches common materials for x-ray windows, including thin sheets of steel.

Schuster (US 5,052,034) and Zunick (US 2,665,390) teach prior art liquid anode x-ray sources.

US Patents to Harding (US 6,647,094 B2; US 6,477,234 B2; 6,560,313 B1 and US 6,185,277 B1) and US Patent Application Publications to Bachmann (US 2002/0048345 A1 and US 2002/0048344 A1), all having at least one common inventor, qualify as prior art under 35 USC 102(b) and teach many of the claimed materials for x-ray and electron windows in liquid metal x-ray sources.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS R. ARTMAN whose telephone number is (571)272-2485. The examiner can normally be reached on 9am - 5:30pm Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thomas R Artman/  
Examiner, Art Unit 2882

Thomas R Artman  
Examiner  
Art Unit 2882